



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/761,338	01/22/2004	Steven E. Hill	778811 (135-2 US (1))	2678
27976	7590	11/16/2005	EXAMINER	
MARK A. LYONS 2059 QUALL ST. LAKEWOOD, OH 44107			DUPUIS, DEREK L	
			ART UNIT	PAPER NUMBER
			2883	
DATE MAILED: 11/16/2005				

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/761,338

Applicant(s)

HILL, STEVEN E.

Examiner

Derek L. Dupuis

Art Unit

2883

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 23 August 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-29, 34 and 35 is/are pending in the application.
- 4a) Of the above claim(s) 4 and 5 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3, 6-29, 34 and 35 is/are rejected.
- 7) ☒ Claim(s) 6, 12, 27-29 and 35 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 January 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 4/26/04&2/28/05.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### *Election/Restrictions*

1. Applicant's election without traverse of Invention I, Species C (claims 1-3 and 6-29) in the reply filed on 8/23/2005 is acknowledged.
2. Claims 4 and 5 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected species, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 8/23/2005.
3. Applicant has cancelled claims 30-33 which were directed towards an unelected invention.

### *Information Disclosure Statement*

4. The information disclosure statements (IDS) submitted on 4/26/2004 and 2/28/2005 have been considered by the examiner.

### *Drawings*

5. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference characters "64" (in the specification) and "69" (in figure 4) have both been used to designate the Doped SRSO film.
6. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the HOE (claim 24), the combiner (claim 25), the optical taper (claim 22), and the optical prism (claim 23) must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.
7. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing

Art Unit: 2883

sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as “amended.” If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either “Replacement Sheet” or “New Sheet” pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### *Specification*

8. The disclosure is objected to because of the following informalities: in sentence starting in line 25 of page 6 does not follow proper grammatical rules. The phrase “at least one integral formed” is improper. In page 7, line 9, the phrase “at least one wave guide are” should apparently be “at least one wave guide is”. The paragraph beginning on line 18 of page 7 appears to be a duplication of the paragraph beginning on line 1 of page 7. Please update the serial number of the documents mentioned in lines 15, 16, 28, and 29 of page 11. In line 15 of page 12, the phrase “using IV semiconductor” should apparently be “using group IV semiconductor”. The unit of measure in line 20 of page 13 is not distinguishable. Characters must be typed and not hand-written. In line 13 of page 16, the phrase “to excite IV semiconductor” should apparently be “to excite group IV semiconductor”. In line 5 of page 17,

the word “he” should apparently be “the”. In line 21 of page 19 the applicant uses the symbol “F#”. The applicant is requested to define this symbol as this symbol is not easily recognizable to one of ordinary skill in the art.

Appropriate correction is required.

### ***Claim Objections***

9. Claim 6 is objected to because of the following informalities: the word “activate” should apparently be “activates”. Appropriate correction is required.

10. Claim 12 is objected to because of the following informalities: the phrase “where the at least one wave guide, wherein the lateral containment element comprises” uses improper grammar. The examiner has interpreted this limitation to mean “where the at least one waveguide or the lateral containment element comprises” Appropriate correction is required.

11. Claim 27 is objected to because of the following informalities: the phrase “an lens” should apparently be “a lens”. Appropriate correction is required.

12. Claim 28 is objected to because of the following informalities: the symbol “F#” is used without an explanation in the claim or the specification explaining it’s meaning. This is not a symbol easily recognizable to one of ordinary skill in the art. Appropriate correction is required.

13. Claim 29 is objected to because of the following informalities: the phrase “a single or multiple microreflectors” should apparently be “ a single microreflector or multiple microreflectors”. The phrase “to efficiently the light signals” should apparently be either “to effectively focus the light signals” or “to effectively couple the light signals”. Appropriate correction is required.

14. Claim 35 is objected to because of the following informalities: the phrase “concentration of from 0.5 to 15 atomic percent” should apparently be either “concentration of between 0.5 and 15 atomic percent” or “concentration from 0.5 to 15 atomic percent”. Appropriate correction is required.

***Claim Rejections - 35 USC § 112***

15. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

16. Claims 3, 8, 12, and 28 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

17. Claims 3, 8, and 12 are rejected because they contain the improper alternative recitation of “and/or”. This “word” is an improper alternative recitation because it does not particularly point out and distinctly claim the subject matter which applicant regards as the invention. The limitation alternatively claims the scope as a broad range (or) and a narrow range (and) in the same claim, which is improper.

18. Claim 28 is rejected because it does not particularly point out and distinctly claim the scope of a “small” F# or a “short” focal length. Applicant must clearly and distinctly claim the scope of the invention.

***Claim Rejections - 35 USC § 103***

19. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are

such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

20. Claims 1-3, 6-29, 34, and 35 rejected under 35 U.S.C. 103(a) as being unpatentable over *Drewery et al (US 2004/0136681 A1)* in view of *Tsunekane et al (US 2002/0126724 A1)*.

21. Regarding claims 1-3, 6-10, 12, 17, and 34, Drewery et al teach a photonic device comprising at least one integral planar waveguide (110) formed from a rare earth doped group IV nanocrystal material (see paragraphs 5, 6, 8, 13, 14, 30, and 43). The device includes a substrate (220), a bottom cladding layer (230), and a core layer containing the REDGIVN material (120). The device also includes a lateral containment element (126, 240) to laterally confine light to a region within the core layer containing the REDGIVN material. The device also includes an optical pump source that activates the nanocrystals in the waveguide which in turn activates the erbium in the waveguide (see paragraphs 4-6, 43, and 53). The device is used to amplify an input signal (see paragraph 1). As can be seen in paragraph 53, the pump source can operate at a variety of frequencies thus meeting the limitation of being a broadband optical pump source. As can be seen in figure 2, the waveguide is a ribbed channel (126). Light is received into the waveguide at an input surface (130) and is output at an output surface (132). The erbium material is dispersed on the surface of the nanocrystals in the silica core (see paragraph 43).

22. Regarding claim 35, Drewery et al teach that the concentration of erbium can be varied to achieve desired optical properties in the waveguide (see paragraphs 5, 8, 9, 10, 14, and 36). It would have been obvious to one of ordinary skill in the art at the time of invention to use an erbium concentration of between 0.5 to 15 atomic percent since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or working ranges involves only routine skill in the art.

23. Drewery et al do not teach that the optical pump source comprises a plurality of LEDs that transversely pump the waveguide layer. Drewery et al also do not teach that coupling optics are used between the LEDs and the waveguides to focus light from the LEDs into the waveguide.

24. Regarding claims 11, 13-16, 18, 19, and 21-24, Tsunekane et al teach an LED pumped optical waveguide device as shown in figure 5. A plurality of broadband LEDs (20) are used to transversely pump light into the waveguide (10). Coupling optics (30) are placed between each LED and the waveguide so as to focus light from each LED into the waveguide. A reflection chamber (80 and 81) surrounds the device to contain light. Drewery et al teach that a optical medium can include multiple fiber cores that are amplified (see paragraph 7). The output light is coupled to another optical element (70) through free space optics as can be seen in figure 5. As shown in figure 6, an optical taper is used to transmit light from the LEDs into the optical medium using TIR. Tsunekane et al also teach that prisms (72) can be used to direct light to various locations. Drewery also teaches that the pump source activates the nanocrystals which in turn activate the erbium (see paragraph 43). Tsunekane et al also teach that an HOE is located downstream from the LEDs. Examples of HOEs are elements 72, 73, and 74.

25. Regarding claims 25-29, Tsunekane et al also teach that a plurality of LEDs (2) can be combined to form a broadband optical pump source to pump light into an amplification medium (1) as shown in figure 3. Drewery et al teach that an amplification medium can comprise a REDGIVN material as discussed above. Tsunekane et al teaches that the combining element can be a focusing element such as a lens or microreflector as is used in other embodiments (see paragraph 65-72) and that the detector (7) detects the fluorescence of the optical medium. The LEDs are aligned with the input lens and with the optical medium as can be seen in figure 3. As



Art Unit: 2883

can be seen in figure the 5, the lens being used to focus the light sources is a plano-convex aspherical lens.

26. Claims 3, 6, 7, 8, 12, and 25, include the recitation that items are “adapted to” perform specific functions. It has been held that the recitation that an element is “adapted to” perform a function is not a positive limitation but only requires the ability to so perform. It does not constitute a limitation in any patentable sense. *In re Hutchinson*, 69, USPQ 138.

27. Claim 20 is a **product-by-process claims**:

Note that a "product by process" claim is directed to the product per se, no matter how actually made, *In re Hirao*, 190 USPQ 15 at 17 (footnote 3). See also *In re Thorpe*, 227 USPQ 964, 966; *In re Luck*, 177 USPQ 523; *In re Fessmann*, 180 USPQ 324; *In re Avery*, 186 USPQ 161; *In re Wertheim*, 191 USPQ 90 (209 USPQ 554 does not deal with this issue); and *In re Marosi et al.*, 218 USPQ 289, all of which make it clear that it is the patentability of the final product per se which must be determined in a "product by process" claim, and not the patentability of the process, and that an old or obvious product produced by a new method is not patentable as a product, whether claimed in "product by process" claims or not. Note that applicant has the burden of proof in such cases, as the above case law makes clear. See also MPEP 2113.

28. Claim 20 does not distinguish over the Drewery et al and Tsunekane et al references regardless of the process used to form the waveguide, because only the final product is relevant, and not the process of making such as forming the waveguide in an opening in a resist prior to the resist being removed.

29. It would have been obvious to one of ordinary skill in the art at the time of invention to combine the inventions of Drewery et al and Tsunekane et al by using the REDGIVN material in amplification medium taught by Drewerey et al in the optical medium of Tsunekane et al.


Motivation to combine these references is that the REDGIVN material increases the photoluminescence of an amplification medium (see paragraph 43 of Drewery) and that the pumping structure taught by Tsunekane et al also allows for good quality control of amplification.

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Derek L. Dupuis whose telephone number is (571) 272-3101. The examiner can normally be reached on Monday - Friday 8:30am-4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frank G. Font can be reached on (571) 272-2415. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
Derek L. Dupuis  
Group Art Unit 2883

**KAVEH KIANNI  
PRIMARY EXAMINER**

